

Notice of Allowability

Application No.

10/726,812

Examiner

SHANE M. THOMAS

Applicant(s)

ZHU, QIMING

Art Unit

2186

- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed 11/24/08.
2. ☒ The allowed claim(s) is/are 1-28,30,32-36, and 38 (renumbered 1-35).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date 20090210.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Shane M Thomas/
Primary Examiner, Art Unit 2186

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Dave Raczkowski (Reg. No. 52,145) on 2/10/2009.

The claims have been amended as follows:

1. A computer-readable medium containing a storage disk device driver architecture for access by a processing system, wherein the architecture comprises:

a RAID class driver including:

a first physical device object representing a RAID system comprised of a plurality of physical disks; and

a plurality of functional device objects, each associated with one of the physical disks and adapted to interface with a respective second physical device object that represents that physical disk, wherein each second physical device object provides a RAID-specific device identification, wherein the first physical device object is attached with each functional device object, and wherein each functional device object is associated with a different physical disk,

wherein the RAID class driver is configured to be loaded into the processing system when a RAID-specific device identification is provided.

2. The computer-readable medium of claim 1, wherein a second physical device object, providing a RAID-specific device identification, is included in a disk controller driver adapted to interface with a disk controller, wherein the disk controller driver is stored on the computer readable medium.

10. The computer readable medium of claim 1,
wherein the second physical device objects interface with the physical disks through at least two disk controllers, and wherein a first portion of the plurality of physical disks is associated with a first disk controller of a first type and a second portion of the plurality of physical disks is associated with a second disk controller of a second type.

28. A method of creating a RAID system comprised of a plurality of physical disks and coupled with a computer system running an operating system, the method comprising:

receiving a RAID-specific device identification for each physical disk of the RAID system, wherein the RAID-specific device identification is received from one or more disk controllers and wherein each disk controller is adapted to interface with at least a portion of the plurality of physical disks, wherein receiving the RAID-specific device identification for each physical disk of the RAID system includes:

receiving, at a first functional device object of a bus driver from a first disk controller of the one or more disk controllers, the RAID-specific device identification for a first physical disk of the RAID system; and

receiving, at a first physical device object of the bus driver from the first functional device object, the RAID-specific device identification for the first physical disk;

binding a respective RAID-specific functional interface to each physical disk of the RAID system, wherein a first respective RAID-specific functional interface is bound to the first device object of the bus driver;

binding all of the RAID-specific functional interfaces to a same disk object through which the entire RAID system is accessed as a single disk; and

providing the operating system with a standard disk device identification via the disk object.

Claim 29. (Canceled)

30. The method of claim 28, wherein a first disk controller is of a first type and a second disk controller is of a second type.

32. The method of claim 28, further comprising initializing a RAID class driver of the RAID system in response to the identification of a RAID controller.

Claim 37. (Canceled)

38. The method of claim 28, further comprising:

loading a RAID class driver when a RAID-specific device identification is received, wherein the RAID class driver binds the respective RAID-specific functional interfaces and binds the RAID-specific functional interfaces to the same disk object representing the entire RAID system; and

when a general device identification for another disk of the computer system is received, passing the general device identification from a bus driver to a disk driver of the operating system.

Reasons for Allowance

Claims 1-28,30,32-36, and 38 (renumbered 1-35) are allowable over the prior art of record.

The following is an examiner's statement of reasons for allowance:

As per claim 1, the prior art of record does not teach or suggest, either alone or in combination, each limitation of the claim when the claim is taken as a whole.

As per claim 15, as previously outlined in the prior non-final Office action filed 5/12/2008, the prior art of record does not teach alone or in combination each claim limitation when the claim is taken as a whole. Specifically, the prior art does not teach a RAID controller that is to induce the loading of a RAID driver that is to represent a RAID system comprised of a plurality of disk and then not having that RAID controller interface with any of the disks comprising the RAID system. Applicant's specification mentions this concept as a "phantom" RAID controller in ¶30. Such a concept is not taught by the prior art of record.

As per claim 28, the limitations of new claim 37, as well as the previously dependent claim 29, has been amended into claim 28. These new limitations, when the claimed invention is taken as a whole, are not taught or suggested, either alone or in combination, by the prior art of record.

Claims 2-14,16-27,30,32-35,36, and 38 are allowable as being dependent upon an allowable base claim.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHANE M. THOMAS whose telephone number is (571)272-4188. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt M. Kim can be reached on (571) 272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shane M Thomas/
Primary Examiner, Art Unit 2186

10 February 2009